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NETWORK SERVICES

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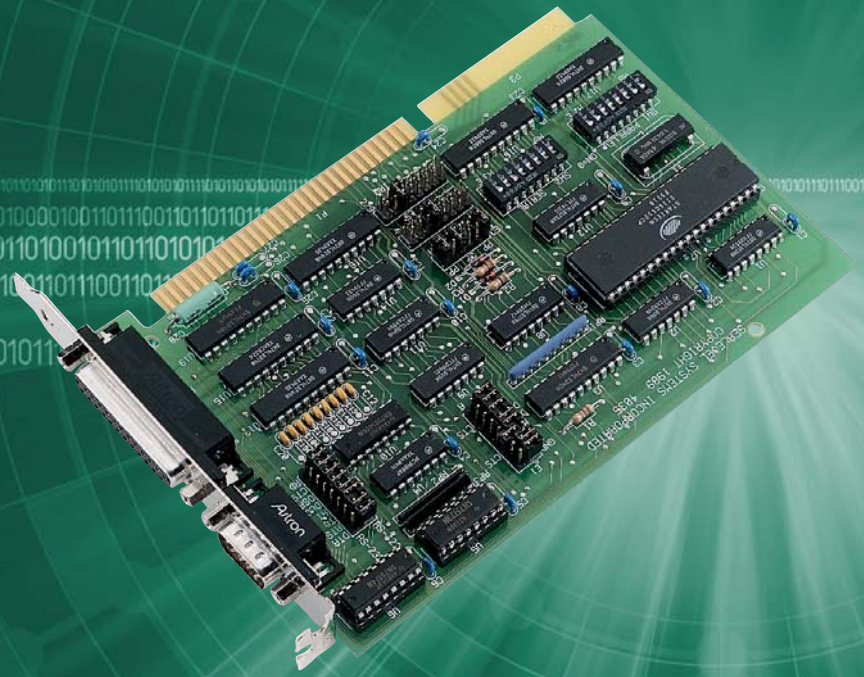
ISA Cards



Control 1, 2, 4, or 8 devices from a single PC.

FEATURES

- Add up to eight serial ports to your ISA bus.
- Cards available for RS-232, RS-422/485, RS-530, V.35, Current Loop, and MIL-188 interfaces.
- Work with DOS, Windows®, or OS/2®.
- Cards with UARTs reach speeds up to 115.2 or even 460.8 kbps.
- Cards with Zilog™ chips achieve speeds beyond 1 Mbps!
- Optically isolated cards protect devices from spikes and surges.

OVERVIEW

If your PC is connected to multiple peripherals—such as modems, data-entry terminals, and printers—you can use just one interface card to add up to eight extra ports (depending on which model you're using). Best of all, you don't need to use all your PC's slots.

We have ISA cards that work with many popular interface and operating system standards. For details about the supported interfaces, see the 1-, 2-, 4-, and 8-port ISA card descriptions on the next two pages.

Suported operating systems include DOS, Windows 3.x/95/98/Me/XP, Windows 2000, Windows NT®, and OS/2.

ISA cards operate at different speeds, depending on the type of card interface. Some ISA cards work without an additional line driver or converter. But other ISA cards (where noted) must use the appropriate line drivers and receivers to achieve the specified speeds. The noted ISA cards must also be able to optimize the other factors that affect performance (such as CPU, number of ports, cable length and quality, and electrical interface).

A diagnostic software program (SSD) on the included CD-ROM tells you if your card is configured correctly.

1-Port ISA Cards

The MIL-188 ISA card (IC179C) helps you link MIL devices to your PC—up to 4000 feet (1219.2 m) away.

The Parallel and Serial RS-232/422/485 ISA card (IC602C) supports both parallel and serial RS-232 and RS-422/485. On the parallel side, the card handles data bidirectionally, so you can transmit data in two directions and double your throughput rate to more than 400 kbps. The card links RS-232 devices up to 50 feet (15.2 m) away and RS-422/485 devices up to 4000 feet (1219.2 m) away.

The RS-422/485 ISA cards (IC050C, IC171C) support 9 IRQs.

2-Port ISA Cards

With the 2-port cards, you can add factory-automation equipment, such as bar-code readers, scales, drill presses, time clocks, and other devices to your PC.

The 2-port cards are available with an RS-232 interface (IC110C) for sustained speeds up to 115.2 kbps. Or, select the RS-232 High-Speed cards (IC130C, IC177C). They support sustained data-transfer speeds of up to 460.8 kbps.

The IC130C and IC177C adapters can be configured as COM1 through COM4 to provide an RS-232 interface for a modem, mouse, or plotter, as well as a higher-speed interface for ISDN applications or V.34 modems.

If you need a more flexible interface, select an RS-232/422/485 card (IC113C). It operates via 2- or 4-wire connections.

The RS-422 mode runs point-to-point and supports up to 10 receivers, and the RS-485 mode has the electrical characteristics to support up to 32 drivers and 32 receivers on one line.

For faster applications, choose an RS-422/485 card. They feature 4 IRQs (IC600C), 11 IRQs and Autoenable (IC051C, IC176C), or optical isolation (IC057C).

These cards automatically handle low-level RS-485 driver maintenance via hardware, so integrating an RS-485 network is simple—with little or no programming changes within Windows and other protected-mode operating systems. Because the cards incorporate unique hardware circuitry that enables the RS-485 interface to appear to be RS-232, no additional software drivers are required. Installation is as easy as picking an address and interrupt level. This means that initial development can be targeted for RS-232, debugged, tested, and then implemented as RS-485.

The optically isolated card (IC057C) eliminates the effects of spikes, surges, and ground differences to protect communications devices connected to the PC. Isolation is important in installations in which equipment being connected to the PC is either far from the PC or is on a different power transformer circuit. The isolated RS-422/485 ISA card provides up to 500 VDC of isolation.

High-speed sync/async adapters (IC121C-R3–IC122C-R3, IC120C-R4) feature two communication channels that use the Zilog 85230 Enhanced Serial Communications Controller (ESCC). Depending on the model you choose, you can link your PC to TIA RS-232, TIA RS-530, or ITU-TSS V.35 devices.

DMA on the adapters supports data rates in excess of 1 Mbps (one million bits per second). Selectable port address is also available on the adapters.

The RS-232 adapter (IC122C-R3) supports RS-232 connections with full modem-clocking options, providing an industry-standard interface to synchronous data links, modems, and other devices.

The IC120C-R4 adapter supports RS-530, which is RS-422/485 on a 25-pin connector. RS-422 allows for extended distance communication—5000 feet (1524 m) at 9600 bps—with virtually error-free differential drive characteristics.

RS-485 is backward compatible with RS-422 but optimized for multidrop applications: Multiple ports can be selectively polled. RS-530 calls for RS-422 signals on a DB25 connector. The RS-530 standard is broken into two interfaces (DTE and DCE), much like RS-232. In addition to the asynchronous modem-control signals on a standard PC serial port, RS-530 specifies synchronous clock signals, modem test signals, and loopback signals.

OVERVIEW (CONTINUED)

The IC121C-R3 incorporates the V.35 connector specification, relying on balanced twisted-pair cabling from the board to the twisted-pair device. V.35 is used for high-speed applications up to the 1-Mbps range and beyond.

4-Port ISA Cards

4-port RS-232 and RS-422/485 cards are available. Cards with Interrupt Status Port (ISP), like the IC102C-R2, provide greater throughput when servicing multiple ports (IRQ sharing) on a single interrupt line.

The RS-422/485 card with 9 IRQs and autoenable (IC058C-R2) enables the RS-485 transmitter during character transmission.

The IC102C-R2 reaches maximum speeds of up to 115.2 kbps sustained or 460.8 kbps burst. For higher-speed applications (up to 460.8 kbps sustained), order the IC058C-R2.

8-Port ISA Cards

These cards work with RS-232 interfaces with ISP. (ISP enables IRQ sharing for higher throughput.) The IC112C-R3 supports sustained speeds of up to 115.2 kbps or burst speeds of up to 460.8 kbps. The IC182C is designed for sustained speeds of up to 460.8 kbps.

Why Buy From Black Box? Exceptional Value. Exceptional Tech Support. Period.

Recognize any of these situations?

- **You wait more than 30 minutes to get through to a vendor's tech support.**
- **The so-called "tech" can't help you or gives you the wrong answer.**
- **You don't have a purchase order number and the tech refuses to help you.**
- **It's 9 p. m. and you need help, but your vendor's tech support line is closed.**

According to a survey by Data Communications magazine, 90% of network managers surveyed say that getting the technical support they need is extremely important when choosing a vendor. But even though network managers pay anywhere from 10 to 20% of their overall purchase price for a basic service and support contract, the technical support and service they receive falls far short of their expectations—and certainly isn't worth what they paid.

At Black Box, we guarantee the best value and the best support. You can even consult our Technical Support Experts before you buy if you need help selecting just the right component for your application.

Don't waste time and money—call Black Box today.

TECH SPECS

Buffer — IC179C, IC171C, IC177C, IC176C, IC182C: 128-byte FIFO;
IC602C, IC050C, IC110C, IC113C, IC600C, IC051C, IC057C: 16-byte FIFO;
IC130C: 32-byte FIFO;
IC102C-R2: (4) 16-byte FIFOs totaling 64 bytes;
IC058C-R2: 64-byte FIFO;
IC112C-R3: (8) 16-byte FIFOs totaling 128 bytes

Communications Chip — IC179C, IC171C, IC177C, IC176C:16850 UART;
IC602C, IC050C, IC110C, IC113C, IC057C: 16554 UART;
IC130C: 16650 UART;
IC121C-R3–IC122C-R3, IC120C-R4: Zilog 85230 ESCC;
IC102C-R2: 16C554 UART;
IC058C-R2: 16750 UART;
IC112C-R3: 16554 UART;
IC182C: 16854 UART

Diagnostics — (1) serial utility CD-ROM with diagnostics (included)

Distance — IC179C: Interface A (DB25 male): 4000 ft. (1219.2 m),
Interface B (DB25 male): 4000 ft. (1219.2 m);
IC602C: Interface A (Parallel): 20 ft. (6.1 m),
Interface B (R2-232): 50 ft. (15.2 m),
RS-422/485: 4000 ft. (1219.2 m),
20-mA interface: Up to 10,000 ft. (3048 m);
IC050C, IC171C, IC600C, IC051C, IC176C, IC057C, IC058C-R2:
Up to 4000 ft. (1219.2 m);
IC110C, IC130C, IC177C, IC102C-R2, IC112C-R3, IC182C:
Up to 50 ft. (15.2 m);
IC113C: Up to 50 ft. (15.2 m) at 9600 bps (RS-232) or up to 5000 ft. (1524 m) at 9600 bps (RS-422/485) with 2500-pF maximum cable capacitance (lower capacitance enables greater distances);
IC122C-R3: Interface A (DB25 M): 50 ft. (15.2 m) @ 9.6 kbps;
IC120C-R4, IC121C-R3: DB25 (RS-530): 5000 ft. (1524 m) @ 9.6 kbps

Manufacturing — IPC 610-A Class-III standards are adhered to with a 0.1 visual A.Q.L. and 100% functional testing

Materials — Boards are built to UL® 94VO rating and are 100% electrically tested; boards are solder mask over bare copper or tin nickel

MTBF (Mean Time Between Failures) — >150,000 hours (more than 17 years)

Number of Ports — IC179C, IC602C, IC050C, IC171C: 1;
IC110C, IC130C, IC177C, IC113C, IC600C, IC051C, IC176C, IC057C, IC122C-R3, IC120C-R4, IC121C-R3: 2;
IC102C-R2, IC058C-R2: 4;
IC112C-R3, IC182C: 8

Operation — IC179C: MIL-188;
IC602C: Parallel and serial RS-232/422/485;
IC050C, IC171C, IC600C, IC051C, IC176C, IC057C, IC058C-R2: RS-422/485;
IC110C, IC130C, IC177C, IC122C-R3, IC102C-R2, IC112C-R3, IC182C:
RS-232;
IC113C: RS-232 or RS-485/422, 2- or 4-wire (individually selectable on each port);
IC120C-R4: RS-530;
IC121C-R3: V.35

Optical Isolation — IC057C: 500 VDC

Protocol — Asynchronous or synchronous/asynchronous

Speed — IC176C–IC177C, IC179C, IC182C, IC171C, IC130C, IC058C-R2:
460.8 kbps (sustained);
IC602C: Serial: Up to 115.2 kbps, Parallel: Up to 400 kbps;
IC600C, IC050C–IC051C, IC057C, IC110C, IC113C, IC102C-R2, IC112C-R3: Up to 115.2 kbps sustained, or bursts of up to 460.8 kbps;
IC121C-R3–IC122C-R3, IC120C-R4: 100 kbps to 1.2288 Mbps

Connectors — IC179C, IC050C, IC171C: (1) DB25 male;
IC602C: (1) DB9 male (serial), (1) DB25 female (parallel);
IC110C, IC130C, IC177C, IC113C, IC600C, IC051C, IC176C, ICC057C:
(2) DB9 male;
IC122C-R3, IC120C-R4: (2) DB25 male;
IC121C-R3: (2) DB15 male (V.35 adapter cable included);
IC102C-R2: (1) DB37 male on card, (1) DB37 female and (4) DB25 male on the included cable;
IC058C-R2: (1) DB37 male on card, (1) DB37 female and (4) DB9 male on the included cable;
IC112C-R3, IC182C: (1) DB78HD female on card, (1) DB78HD male and (8) DB25 male on the included cable

Temperature Tolerance — Operating: 32 to 122°F (0 to 50°C);
Storage: -4 to +158°F (-20 to +70°C)

Humidity Tolerance — 5 to 90% relative humidity, noncondensing

Power — All models: From the PC bus;
IC110C, IC113C: +5 VDC @ 270 mA ±12 VDC @ 50 mA;
IC102C-R2: +5 VDC @ 200 mA ±12 VDC @ 80 mA;
IC112C-R3, IC182C: +5 VDC @ 320 mA ±12 VDC @ 110 mA

Size — IC179C, IC050C, IC171C, IC600C, IC051C, IC176C, IC057C, IC058C-R2:
Half-card;
IC602C, IC121C-R3: ¾ card;
IC110C: 5"W x 5"D (12.7 x 12.7 cm);
IC130C, IC177C: 5"W x 9.3"D (12.7 x 23.6 cm);
IC113C: 5"W x 7.5"D (12.7 x 19.1 cm);
IC122C-R3, IC120C-R4: ¾ card with a second slot cover for a second DB25 port;
IC102C-R2: 4.2"H x 5.3"L (10.7 x 13.5 cm);
IC112C-R3, IC182C: 7"L x 4.2"H (17.8 x 10.7 cm)

Weight — IC110C, IC113C, IC102C-R2: 0.2 lb. (0.1 kg);
IC112C-R3, IC182C: 0.7 lb. (0.3 kg);
All other models: <0.2 lb. (<0.1 kg)

With more people using the Internet, new demands have been placed on computer serial ports. Many PC serial ports aren't equipped to handle the level of buffering required for newer data rates. But advanced UARTs—such as the 16550, 16650, 16750, and 16850—go a long way toward satisfying the requirements.

Each card has either a UART or an ESCC chip. Universal Asynchronous Receiver/Transmitters (UARTs) are asynchronous integrated circuits that convert bytes from the computer bus into serial bits for transmission. Zilog chips (Enhanced Synchronous Communications Controller, or ESCC) are synchronous integrated circuits.

I/O addresses and IRQs

All the UARTs in the ISA cards are buffered, so the CPU is not constantly interrupted to process data.

The adapter is automatically assigned I/O addresses and IRQs by the motherboard. Only the IRQ address can be modified by the user.

16550 UART

Used in the IC602C, IC050C, IC110C, IC113C, IC600C, IC051C, and IC057C, the 16550 features a 16-byte input and output First-In, First-Out (FIFO) buffer that holds the characters for the transmitter and receiver. The FIFO allows you to obtain higher data rates while reducing the frequency of processor interrupts. The IC602C supports speeds up to 400 kbps. All other models with 16550 UARTs support sustained data rates up to 115.2 kbps or bursts of data up to 460.8 kbps.

16554 and 16C554 UARTs

If you order the IC112C-R3, you'll receive a card with two 16554 UARTs that contain four 16550 UARTs, each with a 16-byte FIFO buffer. (The total buffer for the eight ports is 128 bytes.) The IC102C-R2 has a 16C554 UART, which contains two 16550 UARTs, each with a 16-byte buffer. (The total card buffer for the four ports is 64 bytes.)

16650 UART

A 32-byte FIFO buffer is the IC130C's UART's main feature. It can handle sustained data rates up to 460.8 kbps. However, you must use the appropriate line drivers and receivers and be able to optimize the other factors that affect performance (such as CPU, number of ports, cable length and quality, and electrical interface).

16750 UART

The IC058C-R2 has a 16750 UART and a 64-byte FIFO buffer. It also features sustained baud rates of 460.8 kbps, but delivers better performance because of its larger buffer.

16850 UART

The most popular UART, 16850, is used in IC179C, IC171C, IC177C, and IC176C. The 16850 UART has a 128-byte FIFO buffer for each port. This UART features sustained speeds of up to 460.8 kbps.

The 16850 UART has FIFO UARTs that enhance communications. They help you avoid the many I/O problems seen in a multitasking environment—like data overruns or underruns—that occur when the UART buffering isn't large enough to handle the incoming data. These, of course, can interrupt performance and affect your communications.

The 16850 chip also supports an isochronous scheme, which is asynchronous framing with an added clock signal. This scheme allows for much higher data rates and digital-line use (ISDN, T1) where a clock is supplied for data multiplexing. And you can get high-speed communications with a simple communications interface that responds to standard communication calls.

16854 UART

The IC182C has 16854 UARTs. A 16854 UART contains four 16850 UARTs, each with a 128-byte FIFO buffer.

Zilog 85230 ESCC

The IC121C-R3, IC120C-R4, and IC121C-R3 cards use ESCCs. This chip operates at speeds of 100 kbps to 1.2288 Mbps.

IC602C

Item	Code
ISA Cards	
1-Port	
MIL-188	
16550 UART	**IC603C**
16850 UART	**IC179C**
Parallel and Serial RS-232/422/485	
16550 UART	**IC602C**
RS-422/485	
with 2 IRQs	
16550 UART	**IC030C-R2**
16850 UART	**IC170C**
with 9 IRQs and Autoenable	
16550 UART	**IC050C**
16850 UART	**IC171C**
2-Port	
RS-232	
16550 UART	**IC110C**
RS-232, High-Speed	
16650 UART	**IC130C**
16850 UART	**IC177C**
RS-232/422/485, (2- or 4-Wire)	
16550 UART	**IC113C**
RS-422/485	
with 4 IRQs	
16550 UART	**IC600C**
with 11 IRQs and Autoenable	
16550 UART	**IC051C**
16850 UART	**IC176C**
with Optical Isolation	
16550 UART	**IC057C**
Sync/Async, Zilog 85230 ESCC	
RS-232	**IC122C-R3**
RS-530	**IC120C-R4**
V.35	**IC121C-R3**

Item	Code
ISA Cards (Continued)	
4-Port	
RS-232 with ISP	
16C554 UART	**IC102C-R2**
RS-422/485, with 9 IRQs and Autoenable	
16750 UART	**IC058C-R2**
8-Port, RS-232 with ISP	
16554 UART	**IC112C-R3**
16854 UART	**IC182C**

WHAT'S INCLUDED

All models include the card itself and a CD-ROM containing software drivers and a user's manual. Some cards also have special cables designed to connect a V.35 interface or multiple peripherals. These cables are listed below:

IC121C-R3:
- (1) V.35 adapter cable

IC102C-R2:
- (1) DB37 female to (4) 3-foot (0.9-m) cables with DB25 male connectors

IC058C-R2:
- (1) DB37 female to (4) 3-foot (0.9-m) cables with DB9 male connectors

IC112C-R3, IC182C:
- (1) DB78HD male to (8) 3-foot (0.9-m) cables with DB25 male connectors